Claims

1. A method of producing neural pluripotent cells, the method comprising the ex vivo or in vitro culture, under suitable conditions, of mammalian Boundary Cap cells.

2. A method of producing differentiated cells, the method comprising the ex vivo or in vitro culture of mammalian Boundary Cap cells or their progeny, under conditions suitable for differentiation of said cells.

3. The method of claim 2, wherein the BC cells are cultured in the presence of differentiation factors selected from trophic factors, stem cell factors, colony-stimulating factors and lymphokines.

4. The method of claim 2, wherein differentiation into distinct cell types is detected using cell-specific makers.

5. A pharmaceutical composition comprising BC cells, their progeny or derivatives thereof, and a suitable vehicle, excipient or carrier.

6. The pharmaceutical composition of claim 5, wherein said composition comprises from 10^2 to 10^6 cells or more.

7. A method of tissue re-engineering, comprising administering to a subject in need thereof a suitable amount of mammalian BC cells or their progeny, under conditions allowing differentiation or migration of said cells in said subject, thereby allowing tissue re-engineering.

8. The method of claim 7, wherein said conditions include the administration in, at or near a site of neurological disorder.

9. The method of claim 8, wherein said subject suffers from peripheral nerve demyelination, injury or degeneration and wherein said cells are administered to the patient at a site of demyelination, injury or degeneration.

10. A method of claim 7 for reconstituting neural tissue in a subject, comprising administering to a subject in need thereof a suitable amount of mammalian BC cells or their progeny, under conditions suitable for differentiation of said cells into differentiated neural cells in said subject, thereby allowing tissue reconstitution.

11. A method of treating, reducing or alleviating pain in a subject, the method comprising administering to the subject an amount of mammalian BC cells or their progeny, under conditions allowing said cells to differentiate into nociceptive neurons in said subject.

12. A method of treating, reducing or alleviating pain in a subject, the method comprising culturing mammalian BC cells or their progeny in vitro or ex vivo under conditions allowing said cells to differentiate into nociceptive neurons, and administering to the subject said nociceptive neurons.

13. The method of claim 7 or 11 wherein the mammalian BC cells are autologous with respect to the subject.

14. A method of screening compounds that modulate neuronal cell migration and/or differentiation, the method comprising contacting a candidate compound with a BC cell or a progeny thereof, and determining whether said compound modulates migration and/or differentiation of said cells.

15. The method of claim 14, wherein said contacting is performed in vitro or ex vivo.

16. The method of claim 14, wherein said contacting is performed in vivo in a non-human animal.

17. The method of claim 14, for screening compounds that modulate neuron cell differentiation, the method comprising contacting a candidate compound with a BC cell or a progeny thereof, and determining whether said compound modulates differentiation of said cells into cells expressing a neuronal marker selected from the group of β-III tubulin, NeuN, NGF receptor TrkA and parvalbumin.

18. The method of claim 14, for screening compounds that modulate glial cell differentiation, the method comprising contacting a candidate compound with a BC cell or a progeny thereof, and determining whether said compound modulates differentiation of said cells into cells expressing a glial cell marker selected from the group of GFAP and ErbB3.

19. The method of claim 14, for screening compounds that modulate nociceptive cell differentiation, the method comprising contacting a candidate compound with a BC cell or a progeny thereof, and determining whether said compound modulates differentiation of said cells into cells expressing a nociceptive cell marker selected from the group of NGF receptor TrkA, Calcitonin-Gene Related Peptide (CGRP) and Isolectin B4 (IB4).

20. The method of claim 14, for screening compounds that modulate proprioceptive cell differentiation, the method comprising contacting a candidate compound with a BC cell or a progeny thereof, and determining whether said compound modulates differentiation of said cells into cells expressing a proprioceptive cell marker selected from parvalbumin.

21. The method of claim 14, for screening compounds that modulate satellite cell differentiation, the method comprising contacting a candidate compound with a BC cell or a progeny thereof, and determining whether said compound modulates differentiation of said cells into cells expressing a satellite cell marker, selected from GFAP.